इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 14796 (2000): Guidelines on Feedstock for Smelting Reduction Processes [MTD 30: Sponge Iron and Smelting Reduction]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN
IGNORANTIA JURIS NON EXCUSAT
PROTECTED BY COPYRIGHT

REAFFIRMED 2005

भारतीय मानक

प्रगलन अपचयन प्रक्रियाओं हेतु भरण सामग्री पर दिग्दर्शिका

Indian Standard

GUIDELINES ON FEEDSTOCK FOR SMELTING REDUCTION PROCESSES

ICS 77.080.10

© BIS 2000

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 2000 **Price Group 1**

Sponge Iron and Smelting Reduction Sectional Committee, MTD 30

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Sponge Iron and Smelting Reduction Sectional Committee had been approved by the Metallurgical Engineering Division Council.

Most of the iron in the world is produced today by the blast furnace technology. However, due to severe shortage of coking coal as well as to contain atmospheric pollution originated from coke ovens, more emphasis is now being given for development of a suitable smelting reduction technology to partially eliminate the above.

Smooth operation of the smelting reduction reactor depends to a great extent on the raw material input to the reactor, so an effort has been made in this standard to stipulate some norms for the feedstock for smelting reduction processes. Since the raw material input consists of several materials such as iron ore, pre-reduced iron, coal, limestone/dolomite and air or oxygen, this standard has been divided into four sections:

Section I	Ferruginous materials
Section II	Carbonaceous materials (including oil and natural gas which are used as reductants and energy source)
Section III	Fluxing agent
Section IV	Air/Oxygen

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical value (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 MAY 2008
TO
IS 14796 : 2000 GUIDELINES ON FEEDSTOCK FOR SMELTING REDUCTION PROCESSES

(*Foreword, para* 2) — Substitute the following for the existing:

Most of the iron in the world is produced today in blast furnaces. However, owing to severe shortage of coking coal as well as to contain atmospheric pollution originating from coke oven, more emphasis is now being given to the development of a suitable smelting reduction technology to partially eliminate the above.'

(*Page* 1, *clause* 4, *line* 7) — Delete 'also' after the word 'can'.

(*Page* 1, *clause* 5, *line* 9) — Substitute 'non-coking coals to achieve' *for* 'non-coking coals, achieving'.

(*Page* 1, *clause* 5, *line* 11) — Delete 'the' and insert ',' after the word 'Normally'.

(MTD 30)

Reprography Unit, BIS, New Delhi, India

Indian Standard

GUIDELINES ON FEEDSTOCK FOR SMELTING REDUCTION PROCESSES

1 SCOPE

This standard covers the guidelines for feedstock for use in smelting reduction (S.R.) furnaces in terms of chemical and physical requirements.

2 REFERENCE

IS 11336 : 1985 'Guidelines for heat hardened iron ore pellets for iron making in blast furnaces' is a necessary adjunct to this standard.

SECTION I

3 FERRUGINOUS MATERIAL

3.1 Chemical Composition

The chemical composition of the pellets and lumps largely depends on the availability of raw materials. The chemistry of pellets, lumps should be indicated by the following:

> Fe, FeO, SiO_2, Al_2O_3, phosphorus, TiO_2, CaO, MgO, MnO, Cu, moisture, and total alkali (Na_2O, K_2O etc).

4 PHYSICAL AND PHYSICO-CHEMICAL PROPERTIES

Some of the major physical and physico-chemical properties for iron ore pellets/lumps may be in accordance with IS 11336 or any other relevant standards. However, the supplier and the user may determine the acceptable criteria based on their specific requirements. S.R. units are more flexible and can also use iron ore fines as well as lumps depending on the type of pre-reduction unit. Minimum Fe(t) requirement is 62 percent. In case of shaft based processes, low decrepitation tendency is desirable.

If pre-reduced iron is used as feed stock, it should have a low degree of pre-reduction.

SECTION II

5 CARBONACEOUS MATERIALS

Low ash coal should be preferred. As Indian coals have high ash, the total ash and VM content should not exceed 50 percent. Both lump and ground coal (–200 mesh) are used depending on the reactor type. Most of the Indian coals with ash more than 20 percent and VM more than 30 percent can also be used if a high degree of post combustion is maintained in the reactor and is acceptable to the process of S.R. Beneficiation of the non-coking coals, achieving the above ash percent would also be preferred.

Normally the coal having the following composition should be preferred :

Ash	19-22 percent (preferred), however up to 25 percent ash can be tolerated
VM	30-35 percent
S	Less than 0.5 percent
Moisture	5.0 percent

This will call for beneficiation of Indian coals through heavy media cyclones and froth flotation techniques to reduce the ash contents to above levels from initial ash levels of 30-35 percent at a yield of 50-60 percent.

SECTION III

6 FLUXING AGENT

The lime used for slagging may have a nominal composition as follows:

Constituent	*Percent*
CaO	Around 85
MgO	5, *Max*
SiO_2	1.0
Fe_2O_3	0.5
Al_2O_3	1.0

SECTION IV

7 AIR/OXYGEN

Air or oxygen (commercial) is given as gaseous input to S.R. reactors. Any commercially available oxygen/compressed air can be used for this purpose.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. MTD 30 (4080).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	323 76 17 323 38 41
Eastern	1/14 C. I.T. Scheme VII M, V. I. P. Road, Kankurgachi CALCUTTA 700 054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	SCO 335-336, Sector 34-A, CHANDIGARH 160 022	60 38 43 60 20 25
Southern	C. I. T. Campus, IV Cross Road, CHENNAI 600 113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western	Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM.

Printed at : Prabhat Offset Press, New Delhi-2